Fiber Coupled Pulse Shaper for Sub-Nanosecond Pulse Lidar, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

This Small Business Innovation Research Phase I effort will investigate the feasibility of using electro-optic (EO) beam scanning element to control coupling into a fiber as a fiber coupled pulse shaper. The goal of the pulse shaper is to reduce a 4-6ns pulse to 0.4-0.6ns pulse at 1064nm and/or 532nm at input powers at the 2mJ level. The highest utility of the proposed pulse shaper is its programability allowing it to deliver different pulse widths and different pulse shapes. Although this approach to pulse shaping inherently truncates the power of the input pulse, the shaper will find its greatest value in investigating the optimal pulse shape and parameters in a given optical system. As an added benefit, this technology can be directly morphed into a new type of Q-switch for solid state lasers requiring fewer optics, lower drive voltage and high damage threshold. The proposed effort is broken down into 3 primary tasks: 1) fabricate EO scanning elements, 2) assemble a benchtop pulse shaper for characterization and 3) Investigate drive electronics with sub ns rise times and moderately high voltage.

Primary U.S. Work Locations and Key Partners

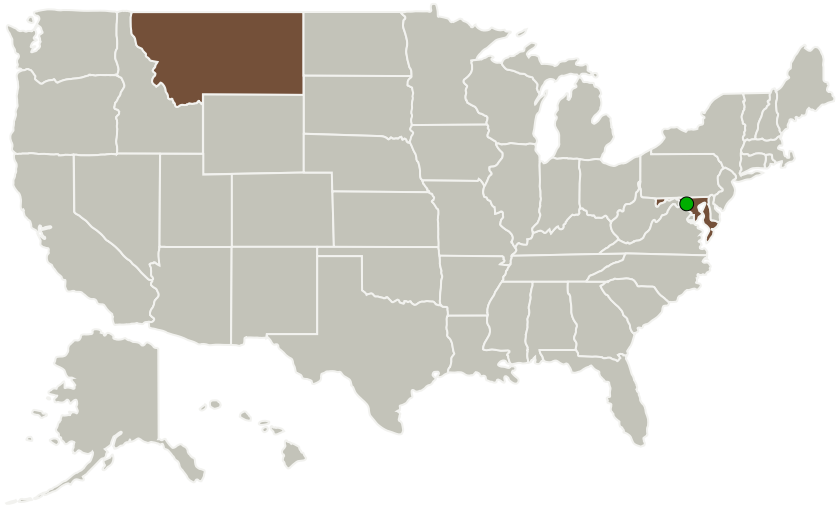

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Table of Contents

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Organizations Performing Work	Role	Type	Location
ADVR, Inc.	Lead Organization	Industry	Bozeman, Montana
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Montana

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139988)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

ADVR, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Anthony Roberts

Co-Investigator:

Tony Roberts

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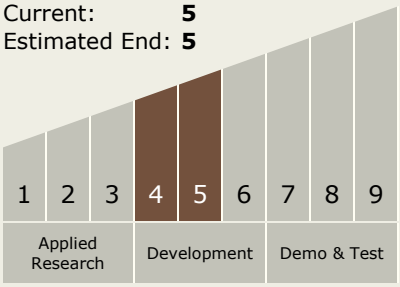
Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.4 Pointing, Acquisition and Tracking (PAT)

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System